



Minería de datos y Patrones

Version 2024-I

Accuracy Estimation

Dr. José Ramón Iglesias

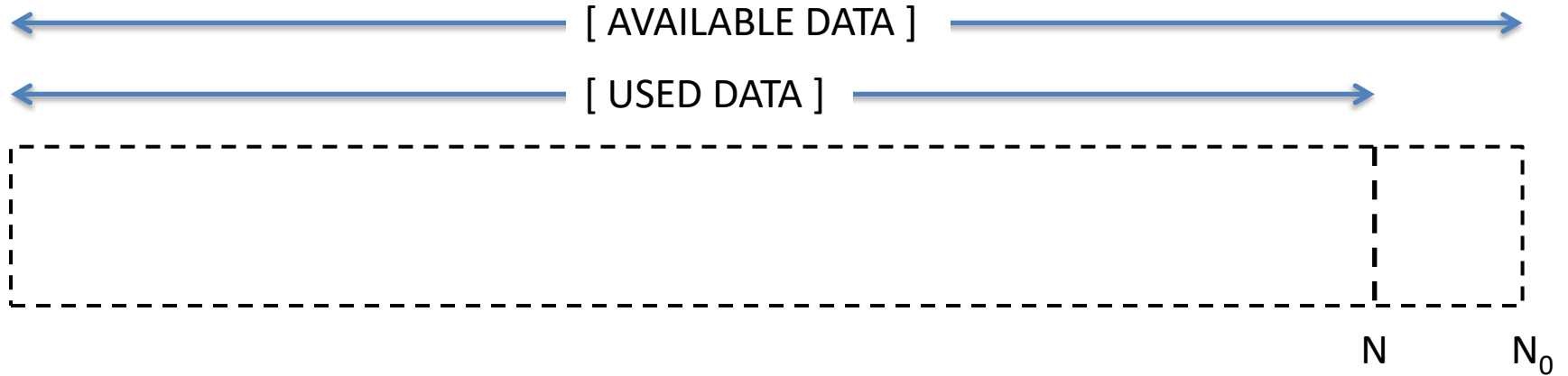
DSP-ASIC BUILDER GROUP

Director Semillero TRIAC

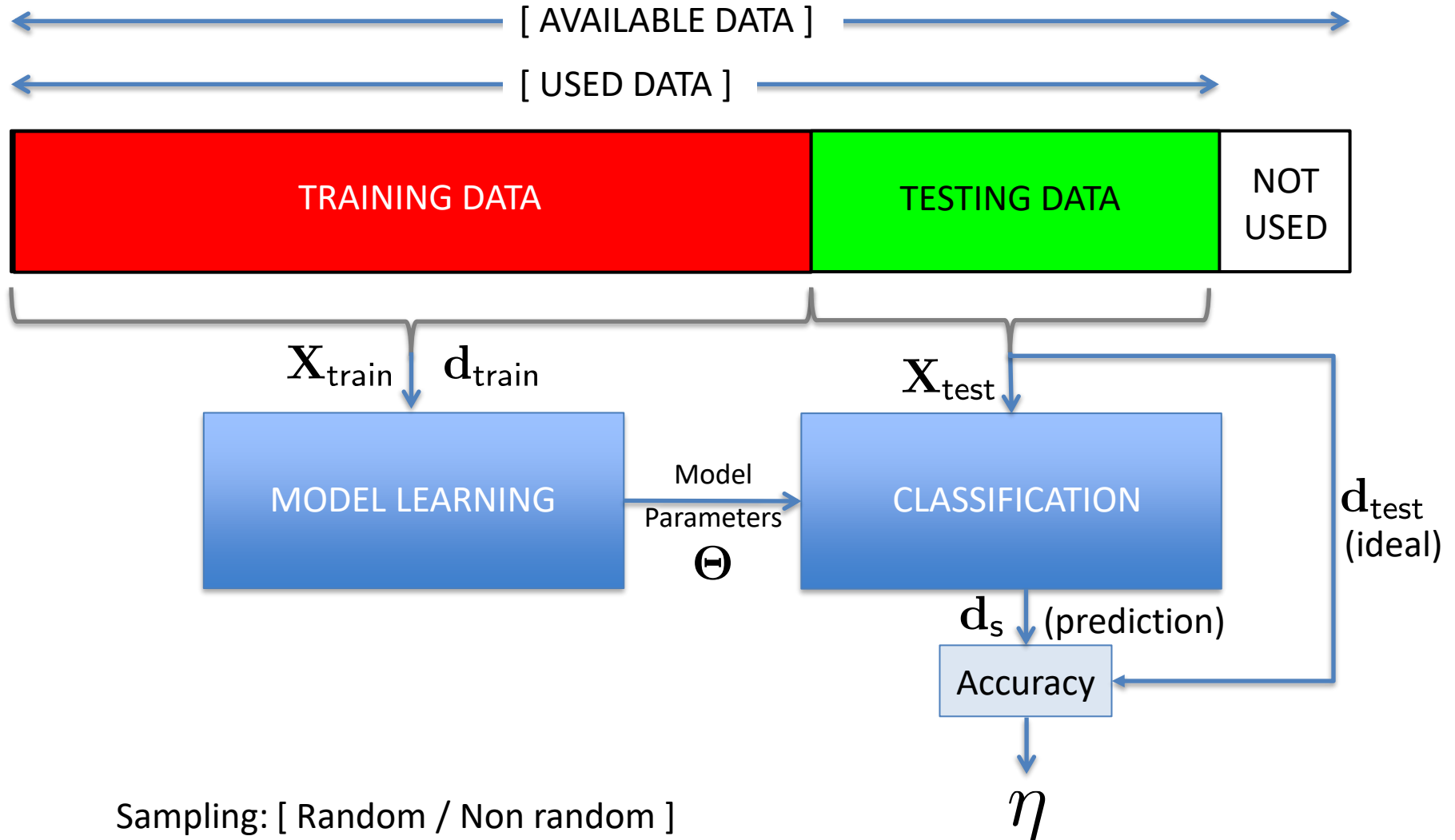
Ingeniería Electrónica

Universidad Popular del Cesar

Estimating the Accuracy of a Classifier



Estimating the Accuracy of a Classifier



Estimating the Accuracy of a Classifier



Estimating the Accuracy of a Classifier



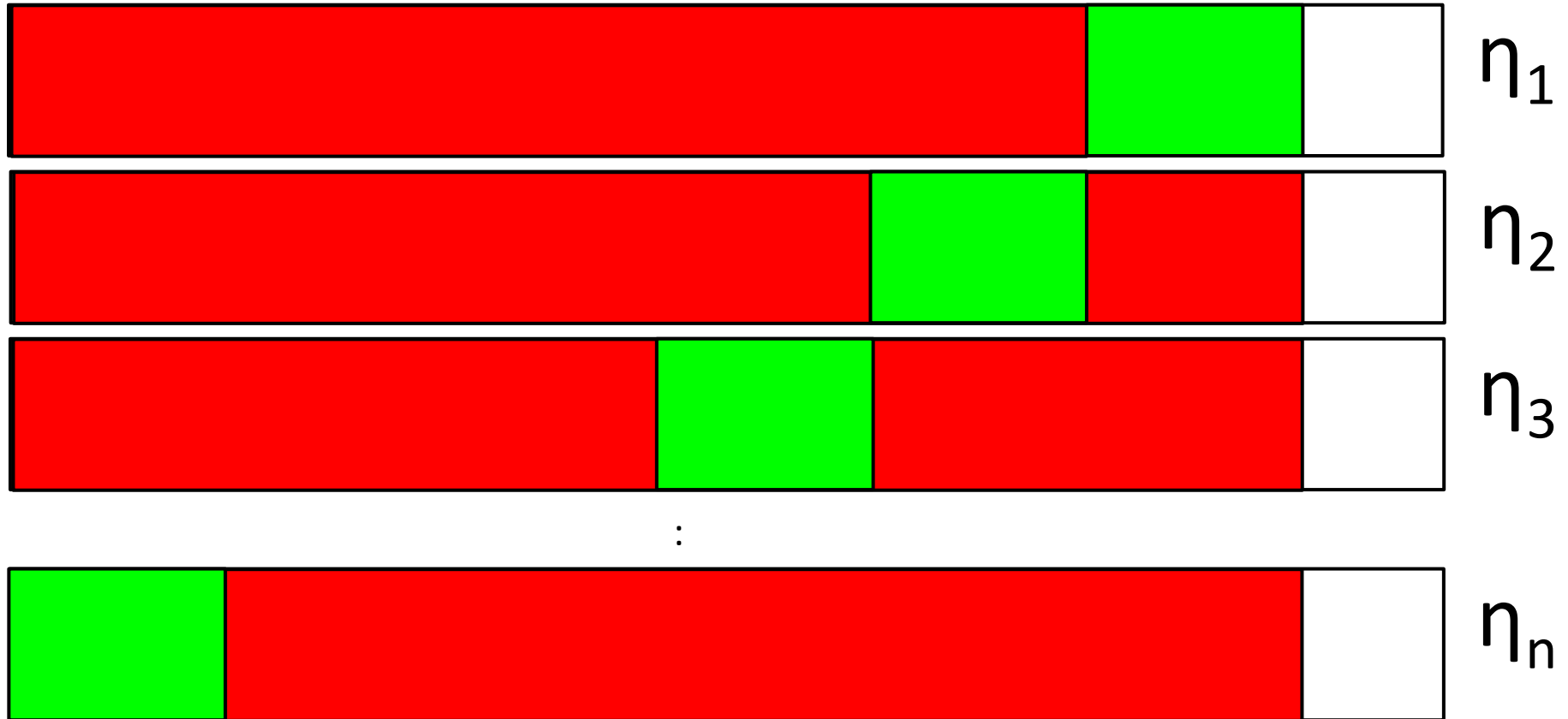
Estimating the Accuracy of a Classifier

HO: HOLD OUT



Estimating the Accuracy of a Classifier

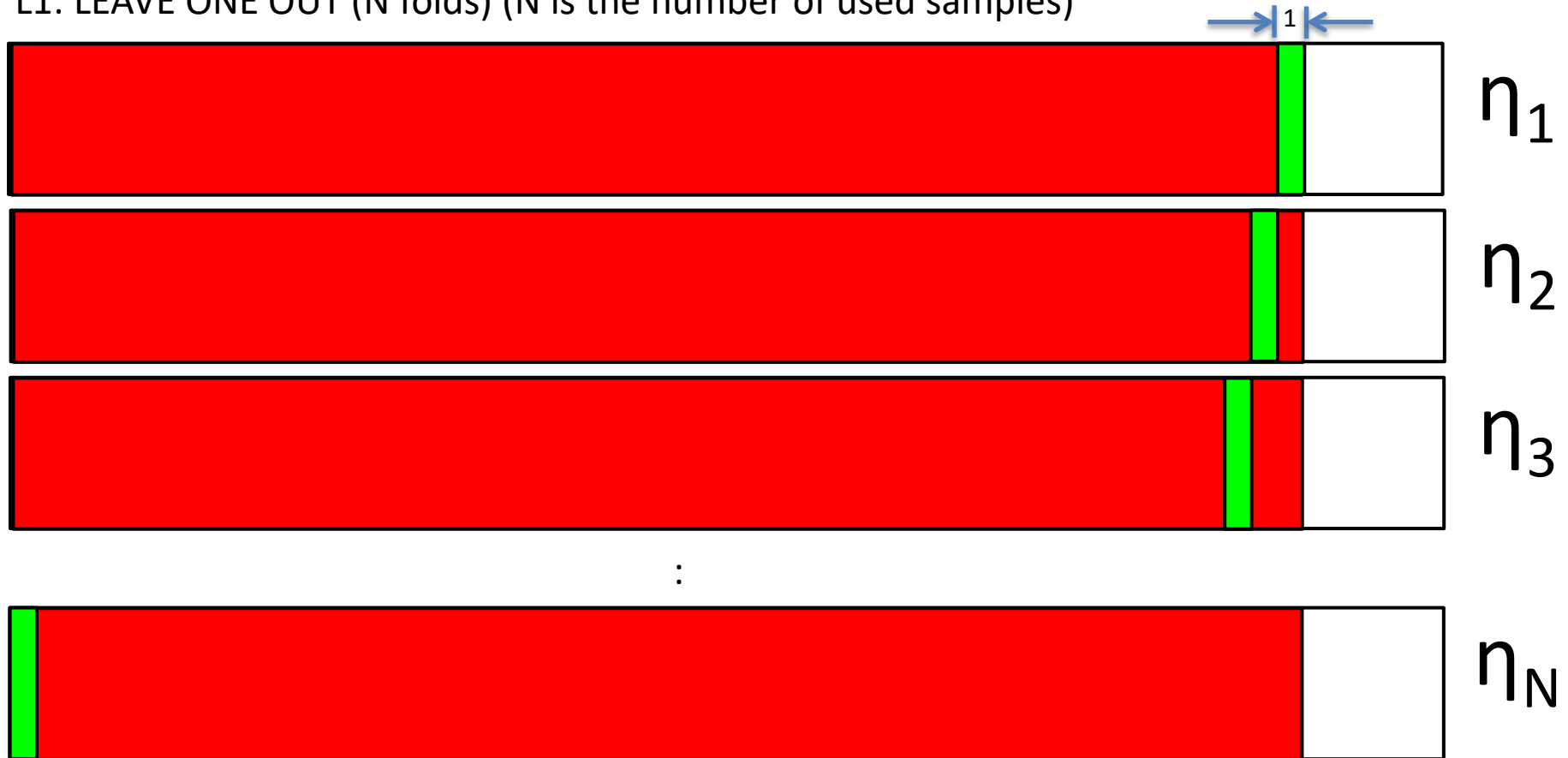
CV: CROSS VALIDATION – n folds



$$\eta = (\eta_1 + \eta_2 + \eta_3 + \dots + \eta_n) / n$$

Estimating the Accuracy of a Classifier

L1: LEAVE ONE OUT (N folds) (N is the number of used samples)



$$\eta = (\eta_1 + \eta_2 + \eta_3 + \dots + \eta_N) / N$$

Estimating the Accuracy of a Classifier

L1*: LEAVE ONE OUT (n folds) (with $n < N$)



$$\eta = (\eta_1 + \eta_2 + \eta_3 + \dots + \eta_n) / n$$

Estimating the Accuracy of a Classifier

[SIMULATED DATA]

2 Classes

2 Gaussian Distributions

$\mu_1 = (1,1)$

$\mu_2 = (-1,-1)$

$\sigma_1 = \sigma_2 = 1$

500 samples /class

$N_0 = 1000$ (available data)

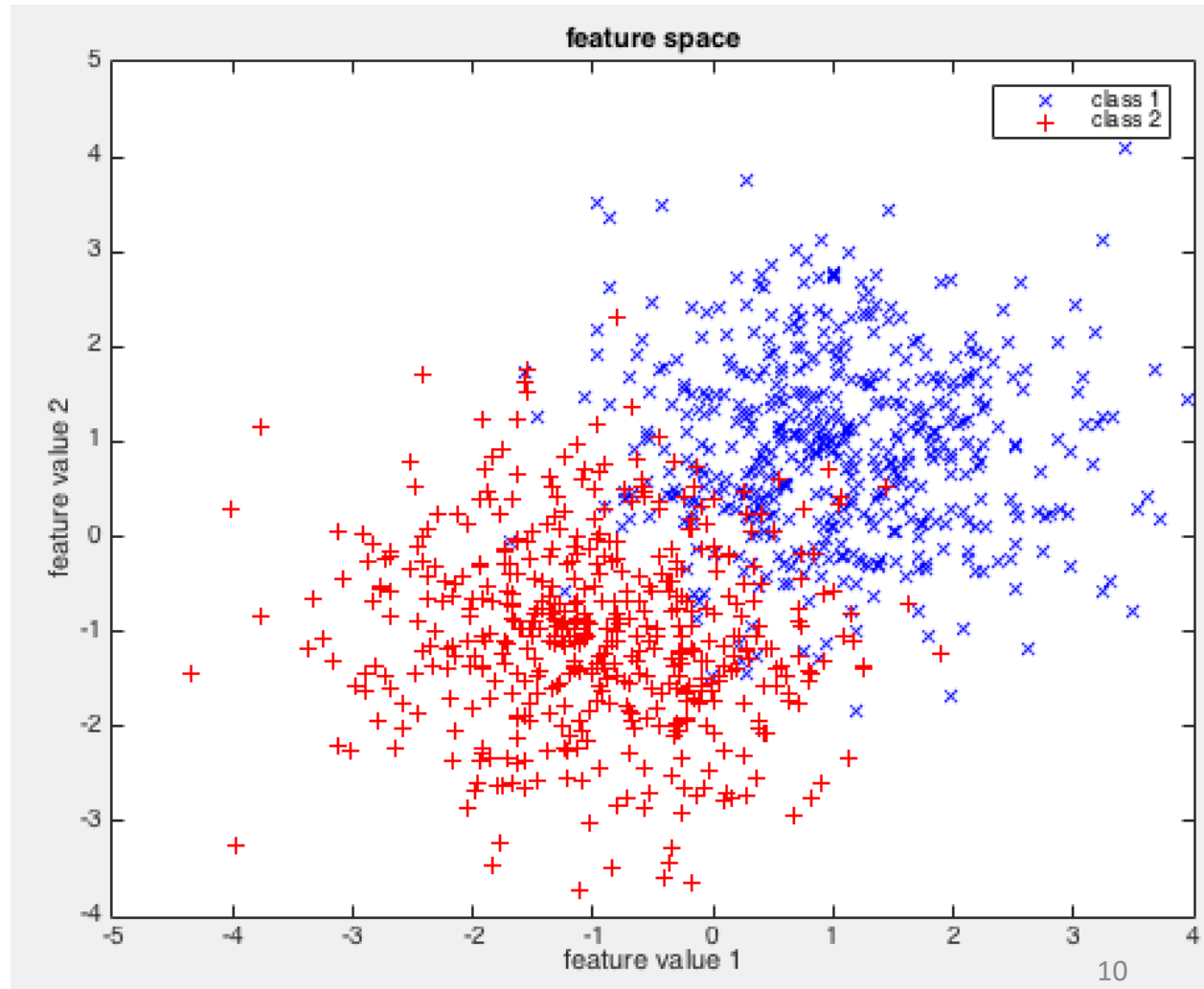
[CLASSIFIER]

Linear SVM (LibSVM)

[SAMPLING]

Random / Stratified

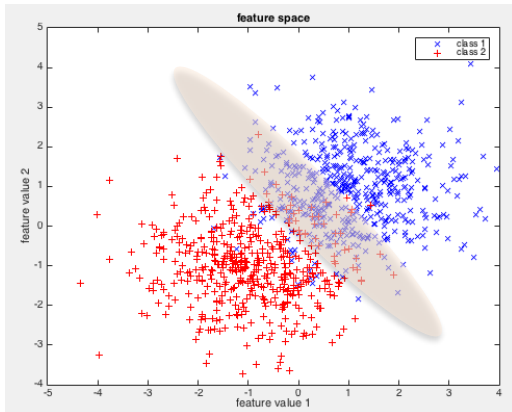
1000 Repetitions!



After 1000 Repetitions!

$N_0 = 1000$ (available data)

N used data



Method:	Parameters	N/ N_0		mean	std	min	max
H0:	90%-10%	:	1	:	acc =		
H0:	80%-20%	:	1	:	acc =		
H0:	75%-25%	:	1	:	acc =		
H0:	67%-33%	:	1	:	acc =		
H0:	50%-50%	:	1	:	acc =		
H0:	90%-10%	:	0.5	:	acc =		
H0:	80%-20%	:	0.5	:	acc =		
H0:	75%-25%	:	0.5	:	acc =		
H0:	67%-33%	:	0.5	:	acc =		
H0:	50%-50%	:	0.5	:	acc =		
H0:	90%-10%	:	0.1	:	acc =		
H0:	80%-20%	:	0.1	:	acc =		
H0:	75%-25%	:	0.1	:	acc =		
H0:	67%-33%	:	0.1	:	acc =		
H0:	50%-50%	:	0.1	:	acc =		
CV:	5-fold	:	1	:	acc =		
CV:	10-fold	:	1	:	acc =		
CV:	5-fold x 20	:	1	:	acc =		
CV:	5-fold x 10	:	1	:	acc =		
CV:	5-fold x 5	:	0.5	:	acc =		
CV:	10-fold	:	0.5	:	acc =		
CV:	5-fold x 20	:	0.5	:	acc =		
CV:	5-fold x 10	:	0.5	:	acc =		
CV:	5-fold	:	0.1	:	acc =		
CV:	10-fold	:	0.1	:	acc =		
CV:	5-fold x 20	:	0.1	:	acc =		
CV:	5-fold x 10	:	0.1	:	acc =		
L1:		:	1	:	acc =		
L1:		:	0.5	:	acc =		
L1:		:	0.1	:	acc =		
L1*:	200-fold	:	1	:	acc =		
L1*:	100-fold	:	1	:	acc =		
L1*:	50-fold	:	1	:	acc =		